

withdrawn from consideration as directed to non-elected subject matter. Claims 1, 10, 12 and 17 have been amended, and new Claims 59 and 60 have been added. Support for new Claims 59 and 60 may be found, for example, in Examples 10 through 12 and Comparative Examples 4 and 5 in the present specification. The specification has been amended to correct a typographical error contained therein. No new matter has been added.

In response to the Restriction Requirement, Applicant reaffirms the April 14, 2000 election, with traverse, of Group I (Claims 1-18). The traversal is on the grounds that it would not be unduly burdensome to examine the claims together because they all relate to combinations including the ink of the elected claims. If the ink is patentable, then the combinations incorporating the ink will also be patentable. Applicant respectfully requests that the Examiner reconsider the restriction requirement, and rejoin the non-elected claims. Applicant also notes that the claims of Group III (Claims 45-52) are related to the elected claims as a process of use. Accordingly, under M.P.E.P. § 821.04, Applicant requests that upon an indication that the subject matter of the claims of Group I is allowable, Applicant be provided with the opportunity to amend the claims of Group III to include the features of the allowable product claim so that they may be rejoined.

In paragraph 6 of the Office Action, the Examiner has indicated that the certified copies of the three Japanese priority applications were not received. As evidence that Applicant in fact submitted the certified copies, enclosed herewith are the date-stamped postcard indicating that they were filed on June 18, 1999, and photocopies of the cover pages of the certified copies of the applications that were submitted.

In response to the objection to the drawings found in paragraph 7 of the Office Action, Applicant has amended the specification at page 39 to refer to the reference numeral 24 included in Figure 1. No new matter has been added.

The rejection of Claims 10 and 17 under 35 U.S.C. § 112, second paragraph, as being indefinite, respectfully is traversed. Nevertheless, without conceding the propriety of the rejection, Applicant has amended Claims 10 and 17 to delete the word "substantially", thereby obviating the rejection.

Claim 1 has been rejected alternatively under 35 U.S.C. § 102(b) or 103(a) as anticipated by or unpatentable in view of Harris, et al. Claims 1-6, 8-10, 12-15, and 17 have been rejected under 35 U.S.C. § 103(a) as unpatentable over Lin in view of either Zou, et al. or Sakuma, et al. Claims 7 and 16 have been rejected under 35 U.S.C. § 103(a) as unpatentable over Lin in view of either Zou, et al. or Sakuma, et al., in further view of Sacripante, et al. Claims 11 and 16 have been rejected

under 35 U.S.C. § 103(a) as unpatentable over Lin in view of either Zou, et al. or Sakuma, et al., in further view of Hotomi, et al. Claims 1, 5, and 8-10 were also rejected under 35 U.S.C. § 103(a) as unpatentable over Tsutsumi, et al. Claims 2-4, 6-7, and 11-18 were also rejected under 35 U.S.C. § 103(a) as unpatentable over Tsutsumi, et al. in view of Yui, et al., Sacripante, et al., and Hotomi, et al. Applicant respectfully requests withdrawal of all of these rejections in view of the claim amendments made above, and remarks found below.

Before addressing each specific rejection, Applicant wishes to point out various novel features and advantages of the presently claimed invention.

Claim 1 relates to an aqueous ink for ejecting in an ink-jet process, comprising a self-dispersing pigment and a resin encapsulating a coloring material. Claim 12 is similar to Claim 1, but further specifies that the self-dispersing pigment has a cationic group.

An object of the present invention is to improve the rub-off resistance of images formed during an ink-jet process using a pigment-based ink, while simultaneously maintaining a high image density. A solution to this problem is complicated in the case of ink-jet printing because a known/conventional solution to the problem of rub-off in general ink printing applications, i.e., adding a resin to the ink, causes the ink to

eject in an unstable manner during the ink-jet process. Therefore, in order to solve the problem of achieving good rub-off resistance without degrading ejection stability, the Applicant has unexpectedly found that encapsulating the coloring material with a resin enhances rub-off resistance without decreasing image density. This problem is not addressed by the cited references.

The Harris, et al. patent discloses an oil-based ink for gravure printing, and is clearly distinct from the aqueous ink-jet process inks of the present invention. Therefore, Applicant submits that the rejection of Claim 1 over Harris, et al. should be withdrawn.

The Lin patent discloses a thermal ink jet ink containing a dye or pigment as a colorant, but as acknowledged by the Examiner at paragraph 14 of the Office Action, the pigment is not self-dispersing and there is no disclosure of a resin for encapsulating the coloring material.

The Lin patent is combined with the Zou, et al. patent, which merely relates to a water-in-oil emulsion ink having a water phase and an oil phase, where the oil phase contains a suspension of an encapsulated colorant. Therefore, there is no motivation to one skilled in the art to combine these references to obtain an ink-jet ink where the colorant is encapsulated, as the Zou, et al. patent addresses an entirely

different kind of ink. Applicant therefore requests that this ground of rejection be withdrawn.

The Lin patent is alternatively combined with the Sakuma, et al. patent, which describes an aqueous ink-jet ink containing a polymer that has a dye or pigment adsorbed to it. However, nowhere does Sakuma, et al. disclose or suggest a self-dispersing pigment that is not adsorbed to a polymer present in the ink. Nor does it address the requirement of the claims that the ink comprise a self-dispersing pigment and a resin encapsulating a coloring material. Further, the Sakuma, et al. patent does not teach or suggest that the rub-off resistance may be enhanced by encapsulating a coloring material with a resin. Thus, it fails even to address the problem that is the focus of the present invention, let alone disclose or suggest the claimed invention.

The deficiencies of Lin in view of either Zou, et al. or Sakuma, et al., discussed above, are not remedied by further combining them with Sacripante, et al. or Hotomi, et al.

Sacripante, et al. relates to an ink-jet ink containing an emulsifiable dye-polymer resin where the dye is chemically attached to the polymer resin. It provides no suggestion that rub-off resistance may be enhanced by providing

an ink comprising a self-dispersing pigment and a resin encapsulating a coloring material.

Hotomi, et al. relates to a non-aqueous ink-jet ink that contains microcapsule particles containing a dye or a pigment as a coloring material. There is no disclosed motivation for one skilled in the art to combine the teachings of Hotomi, et al. and Sacripante, et al. with the references discussed above to form an aqueous ink-jet ink of the present invention.

Neither of Hotomi, et al. or Sacripante, et al. remedies the deficiencies of the primary references set forth above. Accordingly, Applicant respectfully requests that the rejections of Claims 1-18 based on the various combinations with Lin be withdrawn.

The Tsutsumi, et al. patent relates to an aqueous ink for use in ink-jet printing, containing a non-water soluble colorant that is impregnated (encapsulated or adsorbed, or both) into polymer particles, and a humectant such as N-methylglycine. In the Comparative Examples, Tsutsumi, et al. shows inks where some of the colorant is not incorporated into the resin, and N-methylglycine is replaced with diethylene glycol or glycerin. Unlike the claimed inks, however, these Comparative Examples only use a dye as the coloring material, not a self-dispersing pigment. Further, in Table 2, Tsutsumi, et al. is believed to teach away from using these dye-based inks that do not include N-

methylglycine or other amino acids and salts thereof, as Tsutsumi, et al. indicates that these inks have low print density, low ink output, and are more likely to clog the ink jets.

The deficiencies of Tsutsumi, et al. are not remedied by the teachings of any or all of Yui, et al., Sacripante, et al. and Hotomi et al.

Yui, et al. teaches that pigments that may be modified with anionic or cationic function groups may be used in ink-jet inks.

Sacripante, et al. teaches an ink-jet ink having polymer encapsulated colorant, where the polymer has hydrophilic groups that include anionic and cationic groups, and the colorant is a dye.

Hotomi, et al. teaches a non-aqueous ink-jet ink having microcapsule particles containing a dye or a pigment. Applicant submits that Hotomi, et al. is unrelated to the inks of the present invention.

Applicant submits that there is no disclosed motivation for one skilled in the art to combine the teachings of Tsutsumi, et al. with any or all of Yui, et al., Sacripante, et al. and Hotomi et al. to arrive at the presently claimed invention. Even if these references could be properly combined, Applicant submits that they do not teach or suggest an aqueous

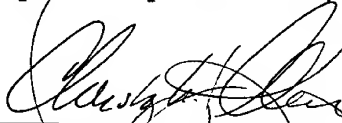
ink-jet ink comprising a self-dispersing pigment and a resin encapsulating a coloring material. Applicant also submits that it would not have been obvious to modify the inks of Tsutsumi, et al. with elements found in the different references to arrive at the present invention because of the high degree of unpredictability in the art.

Applicant submits that the invention as presently claimed is not anticipated by, or obvious in view of, the cited references. Applicant therefore respectfully requests that the rejections be withdrawn.

Applicant submits that this application is in condition for allowance, and a Notice of Allowance is respectfully requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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